

# Urban Furniture Design Integrating Dong Architectural Culture

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**Abstract:** In order to better realize the "cultural" and "regional" development of urban furniture design, achieve the purpose of promoting minority culture and inheriting excellent regional culture. This paper from the aspects of pattern, color, modelling three artistic features analysis was carried out on the architectural culture of dong, and build according to the principles and methods of dong architectural culture gene mapping, extract the cultural factor, after in artistic exaggeration, deformation, increase, decrease, finally the corresponding cultural factor into urban furniture design, The city furniture which not only meets the functional needs but also has the cultural implication is obtained. While spreading and carrying forward national culture, it also provides a new design idea for urban furniture design.

**Keywords:** Dong nationality, Architectural culture, Gene mapping, Urban Furniture Design

The Dong ethnic culture is rich, among which the architectural culture is unique and has left a strong mark in the architectural history of China and even the world. Architectural culture is a representative excellent culture of the Dong people, which has a profound impact on the production and life of the Dong people. It contains the humanistic atmosphere and national aesthetic formed over thousands of years, and is easy to arouse people's ideological resonance [1]. Urban furniture design has a wide range and rich variety, which is the cultural name card of a city and reflects the spiritual outlook and cultural values of the city [2]. Under the trend of cultural integration, we must not ignore the protection and inheritance of traditional culture, and the reasonable integration of traditional culture into urban furniture design, not only effectively realize the promotion and dissemination of regional culture, but also give urban furniture design strong national culture connotation and unique artistic appeal.

## 1. Research status and process

### 1.1 Research Status

#### 1.1.1 Status quo of Dong's architectural culture

Dong nationality is one of the ancient ethnic minorities in China, mainly distributed in Guizhou, Guangxi, Hunan, Hubei and other regions. The Dong nationality has a long history and rich ethnic culture. Under the influence of natural geographical conditions, Dong people live in places rich in rain, humidity and wood all the year round. In order to adapt to the environment and create comfortable living space, Dong people's buildings have unique characteristics and distinct styles. A nation's national beliefs, customs, architectural costumes, etc. are all representative national cultures, which convey the collective consciousness and ideological connotation of the nation and are important symbols that distinguish it from other nations [3].

Dong architecture is the key carrier of inheriting national culture. Timber structure architecture was selected as national intangible cultural heritage in 2006 and occupies an important position in the history of Chinese architecture. However, under the trend of cultural integration, modern architecture gradually occupies a leading position in the construction industry with its advanced sense and technological advantages. Traditional architectural culture is ignored and ignored, and the protection and inheritance are insufficient, leading to the gradual disappearance of national characteristics and fewer and fewer cultural inheritors and craftsmen. China is faced with the serious problem of the loss of intangible cultural heritage and the disappearance of traditional culture [4]. At the same time, there are few practical designs and applications of regional culture in modern life, and more and more young generations do not know or understand excellent traditional culture.

#### 1.1.2 Status quo of urban furniture design

Urban furniture is not only a part of urban public facilities, but also one of the main elements of urban public space, which closely affects People's Daily life. Urban furniture originally refers to public facilities, newsstands and landscape articles in the city. With the increase of urban volume and the enrichment of functions, the concept of urban furniture is gradually transformed into all facilities and equipment that can meet the needs of human public activities in the urban space [5].

Generally speaking, in the design and use of urban furniture, it is necessary to follow some design principles, including humanization principle, integration principle, regionalization principle and environmental protection principle [6]. However, there are some problems in current urban furniture design. First, insufficient attention is paid to users' needs and experience. Residents are the users and consumers of urban furniture, and paying attention to the real needs and user experience of residents is a prerequisite for the construction of reasonable urban furniture. Secondly, the lack of integration and standardization of urban furniture. Most of the urban furniture is isolated, isolated, not connected and integrated with the overall environment, lack of integrity and sense of harmony, third, regional characteristics of culture is not obvious. The design of urban furniture not only meets the functions

of entertainment and rest, but also should pay attention to the combination of regional culture and characteristic culture, adapt measures to local conditions, pursue national and local characteristics, so that users can feel different natural scenery and local customs. Finally, ecology and environmental protection are not emphasized. In the design process, we should consider the impact of urban furniture on the surrounding environment, pay attention to the health and safety of residents, consider the overall relationship between people, urban furniture and the environment, reasonably use and develop local resources, and closely connect with nature.

## 1.2 Research Process

The research process of this paper is shown in Figure 1, which is analyzed and studied from several aspects. First of all, through field investigation, questionnaire survey, literature collection and other methods to collect information about the Dong architectural culture, from the pattern, color, modeling of the artistic characteristics of the Dong architecture, in-depth analysis of the characteristics and connotation of the Dong architectural culture. Secondly, the gene map of Dong architectural culture is constructed from these three aspects, and the factors of Dong architectural culture are summarized. Again, were extracted from the genome, pattern factor, color factor, shape factor and so on architectural culture factor, according to the principle of aesthetics and art gimmick to abstract the cultural factors, such as deformation, cut, and increasing, the final will be done furniture design of architectural culture factor into the city, has both practical function and get the dong ethnic characteristics of urban furniture product design.

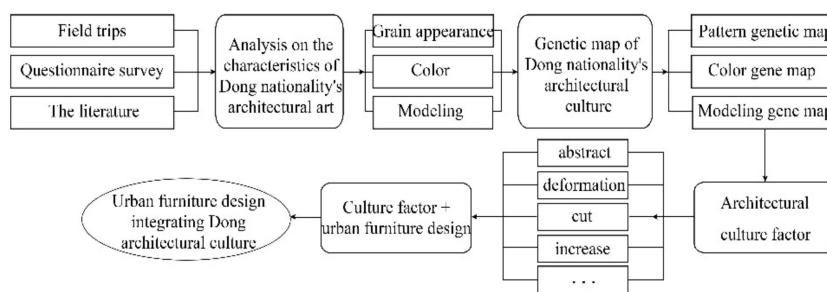


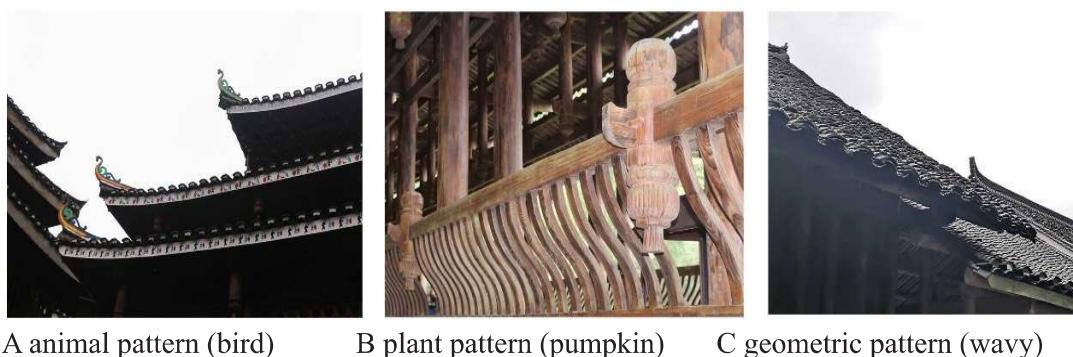
Figure 1 Research process

## 2. Analysis on the architectural culture and art characteristics of Dong nationality

In the traditional Chinese architectural culture, dong architecture has high artistic value, decorative value and cultural value because of its unique style and culture, which gives people different feelings and experiences. The buildings of the Dong ethnic group are diverse, ingenious, unique and exquisite, among which the most representative ones are wind and rain Bridges, drum towers and stilted buildings. Through long-term practice and improvement, dong craftsmen have gradually accumulated rich architectural experience. They can build exquisite and accurate buildings with their superb skills without drawings. The building materials of The Dong people are mainly made of locally abundant fir, and the rational use of natural resources reflects the superb wisdom and national culture of the Dong people since ancient times.

### 2.1 Pattern characteristics

Dong architectural patterns are diverse and characteristic. Since the Dong ethnic group has advocated the idea of "unity of nature and man" since ancient times, most of the patterns come from nature, reflecting the love and respect of the Dong people for nature [7]. According to the content characteristics of patterns, it can be divided into animal patterns, plant patterns and geometric patterns. Animal patterns include dragon pattern, phoenix pattern, Taurus pattern, bird pattern, etc., plant patterns include flower pattern, pumpkin pattern, gourd pattern, lotus root pattern, etc., and geometric patterns include character pattern, wave pattern, etc., as shown in Figure 2.



A animal pattern (bird)      B plant pattern (pumpkin)      C geometric pattern (wavy)

*Figure 2 Architectural pattern of Dong Nationality (self-taken by author)*

### 2.2 Color Characteristics

Color is the main element to create atmosphere, and reasonable color collocation helps to improve the overall texture of architectural design [8]. In the application of color, Dong people are loyal to nature and prefer soft and elegant color collocation instead of strong contrast, which reflects the natural beauty of architecture, as shown in Figure 3.



A Color of outdoor architecture



B Interior architectural color

Figure 3 Architectural color of Dong Nationality (self-taken by author)

chinaXiv:202301.00047v1

### 2.3 Modeling Features

Dong people are a nation with collective consciousness and cultural belief, whose nationality and culture both reflect the long historical precipitation and rich ideological connotation of Dong people [9]. In order to increase national cohesion and concentrate national thoughts, Dong people have gradually formed a building community with their own characteristics after thousands of years of development and evolution, as shown in Figure 4.



Figure 4 Village of Dong Nationality (self-taken by author)

## 3 Construction of dong architectural culture gene map

### 3.1 Principles of gene map establishment

The construction of dong architectural cultural gene map provides a theoretical basis for the design and transformation of dong architectural patterns [10], which is conducive to the integration of ethnic cultural elements, convenient for the use of subsequent design, and can also help people systematically understand traditional culture and sort out the context. The construction process of cultural gene map is tedious and complex, requiring not only a lot of preliminary investigation and data collection, but also following certain methods and principles [11]. The specific principles are as follows:

(1)Take the essence and discard the dregs. By means of literature collection, field investigation and expert consultation, this paper selects a large number of Dong architectural cultural genes, extracts representative cultural factors, excavates and deconstructs the extracted dong architectural cultural genes, and then organizes the genes according to certain rules to construct the genetic map of Dong architectural culture.

(2)Improve the system to meet the needs. As a kind of inductive and auxiliary design system library, the constructed meme map should meet the functional needs of designers and visitors as well as the daily maintenance needs of staff.

(3)Keep pace with The Times and constantly update. Gene mapping is a dynamic and renewable database. With the deepening of investigation and research on national culture, gene mapping needs to be continuously supplemented and improved, with more and more rich content and clearer logic [12].

### 3.2 Structure of the gene map

Based on the cultural background and development process of Dong architecture, this paper mainly divides the genetic map of Dong architecture culture into three parts: pattern gene map, color gene map and shape gene map, as shown in Figure 5.

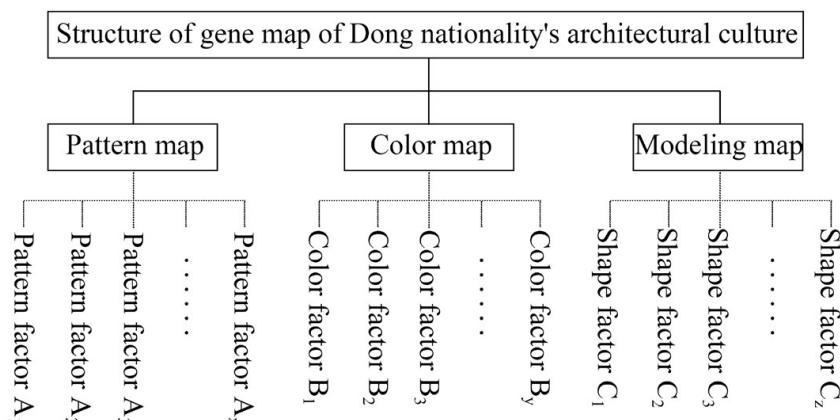


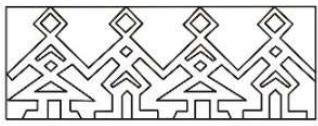
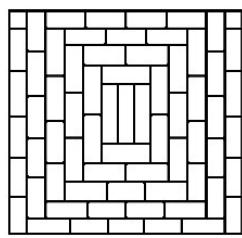
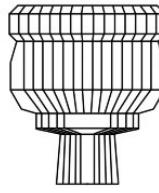
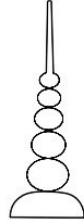
Figure 5 Structure of dong architectural culture gene map

### 3.3 Material arrangement and atlas construction

#### 3.3.1 Pattern gene map

The architectural decoration patterns of Dong ethnic group are rich and diverse, mainly divided into animal patterns dominated by dragon and phoenix patterns, ox patterns, bird patterns and fish patterns, plant patterns dominated by flower and grass patterns, pumpkin patterns, gourd patterns and lotus root patterns, and geometric patterns dominated by character patterns and wave patterns, as shown in Table 1.

*Table 1 Genetic map of pattern*

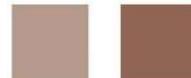
Name	Pattern factor prototype	Grain factor extraction
Pattern factor A <sub>1</sub>		
Pattern factor A <sub>2</sub>		
Pattern factor A <sub>3</sub>		
Pattern factor A <sub>4</sub>		

### 3.3.2 Color gene map

Color is the most intuitive cultural factor in dong architectural culture. Villages of Dong nationality are generally located surrounded by mountains. There are long streams at the village corner and terraced fields at the edge of the village, which are in a beautiful environment by mountains and rivers. Therefore, dong people are romantic and love nature. They are a nation that loves beauty and is good at creating beauty.

In the long life, Dong people gradually give their rich emotions and thoughts to the expression of colors, and different colors have different emotional meanings. They pursue simple, elegant and soft architectural color collocation on the whole, and use bright colors for decoration locally, as shown in Table 2.

Table 2 Color gene map

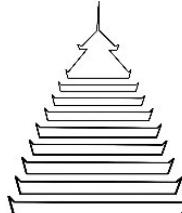
Name	Color factor prototype	Color factor extraction
Color factor $B_1$		
Color factor $B_2$		

### 3.3.3 Modeling gene map

According to the traditional culture and long-term living environment of the Dong people, their ancestors designed buildings that meet the daily production and living needs of the Dong people, as well as the aesthetic and culture of the Dong people, and formed the Dong Village with unique style [13].

There is a saying among the dong people, "Where there is a village, there is a drum tower". There is a drum tower in the center of every Dong village. Drum Tower is the most distinctive building in The Dong Village. The exterior of the drum Tower is modeled on the Chinese fir tree. Dong people believe that the Chinese fir tree has the meaning of driving away evil spirits and avoiding disasters, which can protect the whole village. The village gate is located at the entrance of the village and is the first threshold to enter the Village, witnessing the development and change of the Village from generation to generation. Village gates are different in form and variety, reflecting the extraordinary architectural wisdom and unique architectural culture of the Dong people, as shown in Table 3.

Table 3 Modeling gene map

Name	Factor source	Modeling factor prototype	Modeling factor extraction
Shape factor $C_1$	The drum tower		



#### 4. Extraction of dong architectural culture gene

Article using cultural gene mapping summary, creative architectural culture of dong regularly and systematically presented, and corresponding factors extracted from genome, factor through abstraction, deformation and exaggeration, simplified and innovation of art, delete the independence, auxiliary elements, keep its characteristic culture elements, combined with urban furniture design. While inheriting and spreading minority culture, it adds new elements and styles to modern urban furniture design.

##### (1)Grain gene extraction

Pattern factor A3 and pattern factor A6 were extracted from the pattern gene map, and then simplified, deformed and innovated to obtain the final cultural factor, as shown in Figure 6.

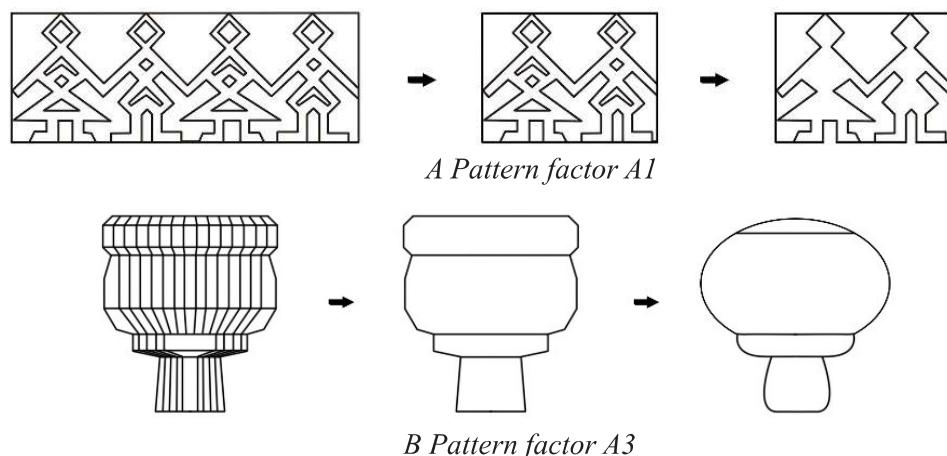
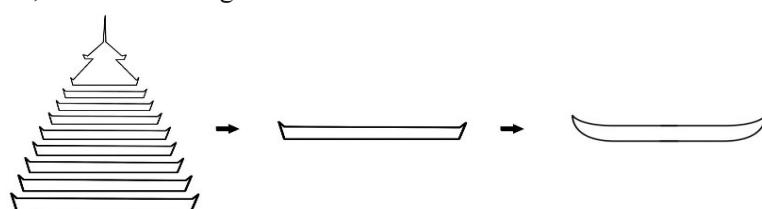


Figure 6 Extraction of grain factor

##### (2)Modeling gene extraction

According to the modeling gene map, the modeling factor C1 is extracted from it, and appropriate abstract deformation and innovative design are carried out according to artistic techniques and aesthetic principles, as shown in Figure. 7.



*Figure 7 Modeling factor extraction*

## 5. Urban furniture design integrating with Dong architectural culture

This paper integrates the extracted architectural cultural factors of The Dong nationality into the urban furniture design, which not only adds some cultural flavor to the city, but also achieves the purpose of spreading and carrying forward the traditional culture of ethnic minorities under the premise of meeting the overall design style of the city.

The cultural factors of Dong architecture are integrated with the design of bus shelter. The overall shape of the top of the shelter adopts the simplified form of modeling factor C1, and the simple, elegant and soft color collocation is selected according to color factor B1. Wood is the main material, reflecting the original ecology and environmental protection, and also accords with the characteristics of Dong building materials. In the local details, the extraction form of pattern factor A1 is adopted to fully reflect the national characteristics and culture. Representative cultural factors are added to the street lamp design, and pattern factor A3 is applied to the upper shape of the street lamp to simulate the shape of pumpkin, representing the yearning and expectation of dong people for a better life, as shown in Figure 8

*Figure 8 Bus shelter design*

## 6. Conclusion

Based on the systematic research methods such as factor extraction and map construction of Dong architectural culture, this paper has been applied in the design of urban furniture products represented by bus shelters, trash cans and street lamps, and analyzed and studied the combination of traditional national culture and modern urban furniture design under the background of regional culture. On the one hand, it is conducive to promoting the protection and inheritance of regional traditional culture and making traditional culture "go out". On the other hand, it also provides new design concepts and ideas for urban furniture design and adds humanistic atmosphere and cultural connotation to modern

cities. At the same time, it also enhances the aesthetic value, cultural value and decorative value of urban furniture design. This systematic and scientific research method has obtained new design language in traditional culture, which has played a driving role in the future development of national culture.

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